WHAT IS CLAIMED IS;

1. A monolithically formed ferromagnetic thin film memory element, comprising:

magnetic storage means having an upper surface and a lower surface;

first shielding means having a soft magnetic material, said first shielding means positioned above the upper surface of the magnetic storage means; and

second shielding means having a soft magnetic material, said second shielding means positioned below the lower surface of the magnetic storage means.

2. A monolithically formed ferromagnetic thin film memory element according to claim 1, further comprising:

a word line having an inner surface and an outer surface;

a digital line having an inner surface and an outer surface, the inner surface of said digital line spaced from the inner surface of said word line, with the magnetic storage means positioned therebetween;

said first shielding means positioned adjacent the outer surface of the word line; and

said second shielding means positioned adjacent the outer surface of the digital line.

3. A monolithically formed ferromagnetic thin film memory element according to claim 2, further comprising a first barrier means situated between said first shielding means and the outer surface of said word line.

4. A monolithically formed ferromagnetic thin film memory element according to claim 3, further comprising a second barrier means situated between said second shielding means and the outer surface of said digital line.

5. A monolithically formed ferromagnetic thin film memory element according to claim 3, further comprising a first insulating means situated between said magnetic field sensitive bit region and the inner surface of said word line.

6. A monolithically formed ferromagnetic thin film memory element according to claim 5, further comprising a second insulating means situated between said magnetic field sensitive bit region and the inner surface of said digital line.

7. A monolithically formed ferromagnetic thin film memory element according to claim 4, wherein the word line has two opposing side surfaces extending between the inner surface and the outer surface thereof, said first shielding means also extending adjacent the two opposing side surfaces of said word line.

8. A monolithically formed ferromagnetic thin film memory element according to claim 7, wherein said digital line has two opposing side surfaces extending between the inner surface and the outer surface thereof, said second shielding means also extending adjacent the two opposing side surfaces of said digital line.

9. A monolithically formed magneto-resistive memory element, comprising:

a word line having an inner surface and an outer surface;

a digital line having an inner surface and an outer surface, the inner surface of said digital line spaced from the inner surface of said word line;

a magnetic field sensitive bit region between the inner surface of said word line and the inner surface of said digital line;

a first shielding layer having a soft magnetic material, the first shielding layer positioned adjacent the outer surface of the word line; and

a second shielding layer having a soft magnetic material, the second shielding layer positioned adjacent the outer surface of the digital line.

10. A monolithically formed magneto-resistive memory element according to claim 9, further comprising a first barrier layer between said first shielding layer and the outer surface of said word line.

11. A monolithically formed magneto-resistive memory element according to claim 10, further comprising a second barrier layer between said second shielding layer and the outer surface of said digital line.

12. A monolithically formed magneto-resistive memory element according to claim 9, wherein the word line has two opposing side surfaces extending between the inner surface and the outer surface thereof, said first shielding layer also extending adjacent the two opposing side surfaces of said word line.

13. A monolithically formed magneto-resistive memory element according to claim 9, wherein said digital line has two opposing side surfaces extending between the inner surface and the outer surface thereof, said second shielding layer also extending adjacent the two opposing side surfaces of said digital line.

SUBD4) 14. A monolithically formed magneto-resistive memory element according to claim 9, further comprising a first insulating layer between said magnetic field sensitive bit region and the inner surface of said word line.

15. A monolithically formed magneto-resistive memory element according to claim 14, further comprising a second insulating layer between said magnetic field sensitive bit region and the inner surface of said digital line.

16. A monolithically formed magneto-resistive memory element according to claim 9, wherein the word line is positioned below said magnetic field sensitive bit region and said digital line is positioned above said magnetic field sensitive bit region.

17. A monolithically formed magneto-resistive memory element according to claim 16, further comprising a lower insulating layer positioned below the magnetic field sensitive bit region, the lower insulating layer having a cavity formed therein, wherein the cavity has a bottom surface and two spaced side surfaces, the first shielding layer having an inner surface and an outer surface, wherein the outer surface of the first shielding layer

is adjacent the back surface of the cavity, and the outer surface of said word line is positioned adjacent the inner surface of the first shielding layer.

18. A monolithically formed magneto-resistive memory element according to claim 17, further comprising a first barrier layer between said first shielding layer and the outer surface of said word line.

19. A monolithically formed magneto-resistive memory element according to claim 18, wherein the inner surface of the word line substantially lies in the plane formed by the upper surface of the lower insulating layer.

20. A monolithically formed magneto-resistive memory element according to claim 19, further comprising a first insulating layer between the inner surface of the word line and the magnetic field sensitive bit region.

21. A monolithically formed magneto-resistive memory element according to claim 20, further comprising a second insulating layer between the inner surface of the digital line and the magnetic field sensitive bit region.

22. A monolithically formed magneto-resistive memory element according to claim 21, further comprising a second barrier layer between said second shielding layer and the outer surface of said digital line.

23. A method for monolithically forming a ferromagnetic thin film memory element, comprising:

forming a lower shielding layer using a soft magnetic material;

forming a magnetic storage means above the lower shielding layer;

forming an upper shielding layer using a soft magnetic material above said magnetic storage means; and

said lower shielding means, said upper shielding means and said magnetic storage means all monolithically formed on a common substrate.

24. A method according to claim 23, further comprising the step of forming a first conductive layer between said lower shielding layer and said magnetic storage means.

25. A method according to claim 24, further comprising the step of forming a second conductive layer between said upper shielding layer and said magnetic storage means.

26. A method according to claim 25, further comprising the step of forming a first barrier layer between said lower shielding layer and said first conductive layer.

27. A method according to claim 26, further comprising the step of forming a second barrier layer between said upper shielding layer and said second conductive layer.

28. A method according to claim 25, wherein said first conductive layer functions as a word line.

29. A method according to claim 28, wherein said second conductive layer functions as a digital line.

30. A method of forming a ferromagnetic thin film memory element having an upper magnetic field shield and a lower magnetic field shield, the method comprising the steps of:

providing an insulating layer;

forming a cavity in said insulating layer, wherein the cavity has a bottom surface and two spaced side surfaces;

providing a first soft magnetic material layer above the bottom surface of the cavity, thereby partially filling the cavity;

providing a first conductive layer in the cavity and above the first soft magnetic material layer to at least substantially fill the cavity;

providing a first insulating layer over the first conductive material layer;

forming a magneto-resistive bit region above said first insulating layer;

providing a second insulating layer above said magneto-resistive bit region;

providing a second conductive material layer above the second insulating layer; and

providing a second soft magnetic material layer above the upper surface of the second conductive material layer.

31. A method according to claim 30, wherein said first soft magnetic material layer is provided on both the bottom surface and at least part of the side surfaces of the cavity.

32. A method according to claim 30, wherein said second conductive material layer has an upper surface, a lower surface, and two spaced side surfaces, wherein the second soft magnetic material layer substantially covers the upper surface and the two spaced side surfaces of the second conductive material layer.

33. A method according to claim 30, further comprising the step of providing a first barrier layer on said first soft magnetic layer before providing said first conductive layer in the cavity.

34. A method according to claim 33, further comprising the step of providing a second barrier layer on the upper surface of the second conductive material layer before providing said second soft magnetic material layer.